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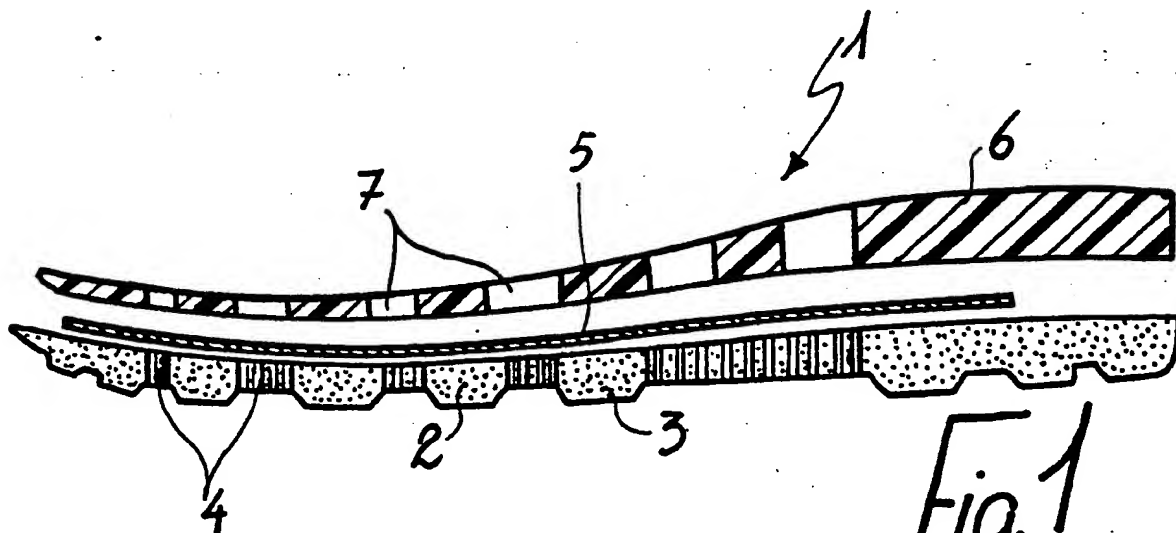
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(54) Sole structure for footwear.

(57) The sole structure (1) comprises a lower part (2) with a tread (3), preferably made of rubber or other synthetic material, and having micro-pores (4) formed therein which traverse its thickness. The lower part (2) is covered by a membrane (5) made of microporous, waterproof material which permits trans-

piration. The structure (1) is completed by an upper part (6) adapted for having a foot rested thereon and being made of rubber or other synthetic material. Holes (7) traverse the thickness of the upper part (6) at the portion thereof affected by the membrane (5).



EP 0 382 904 A2

Fig. 1

The present invention relates to a sole structure for footwear.

The current widespread use of footwear with soles made of synthetic material or rubber is known.

Such footwear has undoubted advantages from the point of view of production and economy as well as from the point of view of being very practical in use.

The soles are in fact waterproof, wear-resistant, antislip, and can be produced in various shapes with desirable aesthetic effects, as well as being easy to use and economical.

However, such known types of soles have a considerable disadvantage, which resides in the fact that no outward transpiration of the sole of the foot is allowed, causing discomfort for the user or even giving rise to the condition known as "athlete's foot".

The aim of the present invention is to provide a sole structure made of synthetic material or rubber, which is produced in such a manner as to allow the transpiration of the foot despite being waterproof.

A consequent primary object of the invention is to provide a sole structure which has the same advantages as those currently commercially available, as well as being waterproof and allowing transpiration.

Another important object of the invention is to provide a sole structure which can be manufactured at low cost and which can therefore be sold at a competitive price.

A further object of the invention is to provide a sole structure which can be manufactured with known devices and methods.

A not least object of the invention is to increase the user's comfort.

This aim, these objects and others which will become apparent hereinafter are achieved by a sole structure for footwear, characterized in that it comprises at least one lower part having a tread, a plurality of micro-pores traversing the thickness of said at least one lower part and being covered by at least one membrane made of waterproof microporous material capable of permitting transpiration, and at least one upper part attached to said lower part and having through holes which traverse its thickness.

Further characteristics and advantages of the invention will become apparent from the detailed description of a preferred embodiment thereof, illustrated only by way of non-limitative example in the accompanying drawings, wherein:

figure 1 is a longitudinal sectional view of a preferred embodiment of the parts which compose the sole structure according to the invention;

figure 2 is an exploded view of a sole structure according to the invention;

figure 3 is a longitudinal sectional view of the sole structure according to the invention when assembled.

With reference to the above described figures, a sole structure for footwear according to the invention, which permits transpiration while being waterproof, is generally indicated by the reference numeral 1 and essentially comprises a lower part 2, with a tread 3, made of synthetic material or rubber or similar material and provided with a series of fine holes or micro-pores 4 which traverse its thickness and are conveniently arranged in its inner regions.

A waterproof microporous membrane 5, which permits transpiration, is arranged above said part 2. The membrane 5 is preferably made of material such as the material known by the Trade Mark "Gore-Tex" or another equivalent material.

The structure is completed by an upper part 6 on which the foot rests. The upper part is attached to the lower part 2 and has a series of holes 7 which traverse its thickness.

Said upper part 6 is also made of synthetic material or rubber or similar material and is assembled and coupled to the upper part 2 in the regions which are not affected by said microporous membrane 5.

The structure according to the invention can be manufactured by means of current methods without any difficulty. The assembly of the lower part 2 and the upper part 6 must be effected to finally form a monolithic structure so as to prevent the infiltration of water through the joint defined between the two parts.

The fact should furthermore be stressed that during assembly, no adhesive or other material must affect the regions provided with micro-pores 4, with the holes 7 and the regions occupied by the membrane 5.

Examples of methods usable to produce the structure of sole according to the invention can be injection-molding or press-glueing.

In the case of injection moulding, once the lower part 2 is injected into the mold, the membrane 5 can be positioned and the upper part 6 can then be injected.

The resultant structure is monolithic and the microporous membrane 5 is embedded therein.

In the case of press-glueing, the lower part 2 and the upper part 6 are molded beforehand and are subsequently coupled by means of adhesives after interposing said membrane 5.

The final result is a structure which, by virtue of the presence of the membrane, is waterproof in one direction while allowing the foot to transpire, through the various perforations and the membrane, in the opposite direction.

In practice it has thus been observed that the

invention has brilliantly achieved the intended aim and objects, a sole structure having been provided which can be produced with current methods and devices and is suitable for achieving a greater comfort of the foot by permitting transpiration while remaining waterproof, thereby completely eliminating the main disadvantage of known sole structures.

The invention thus conceived is susceptible to numerous modifications and variations, all of which are within the scope of the inventive concept; all the details may furthermore be replaced with technically equivalent elements.

In practice, any materials, shapes and dimensions may be employed, providing that they are compatible with contingent requirements and the intended use.

Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

#### Claims

1. Sole structure for footwear, characterized in that it comprises at least one lower part having a tread, a plurality of micro-pores traversing the thickness of said at least one lower part and being covered by at least one membrane made of microporous waterproof material capable of permitting transpiration, and at least one upper part attached to said lower part and having through holes which traverse its thickness.

2. Sole structure according to claim 1, characterized in that said micro-holes extend on the entire extension of said lower part or only on a part thereof.

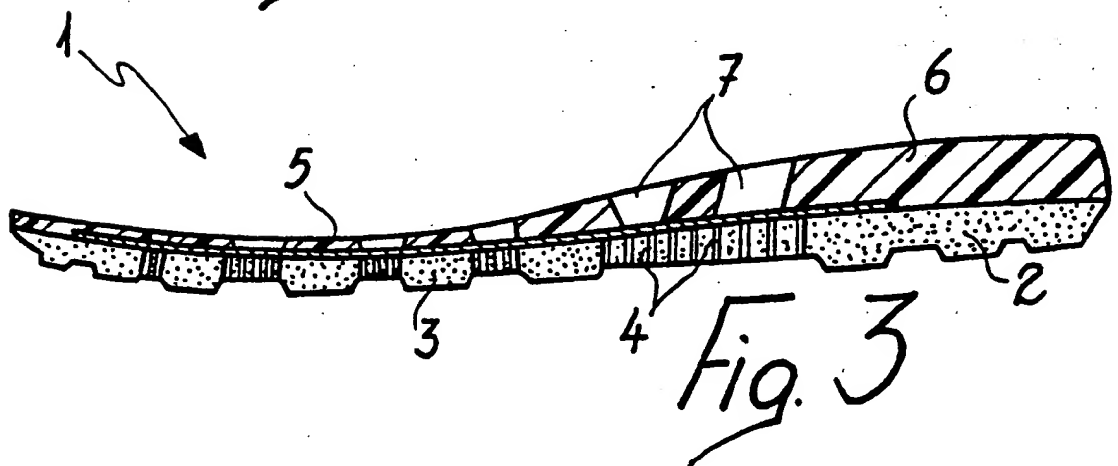
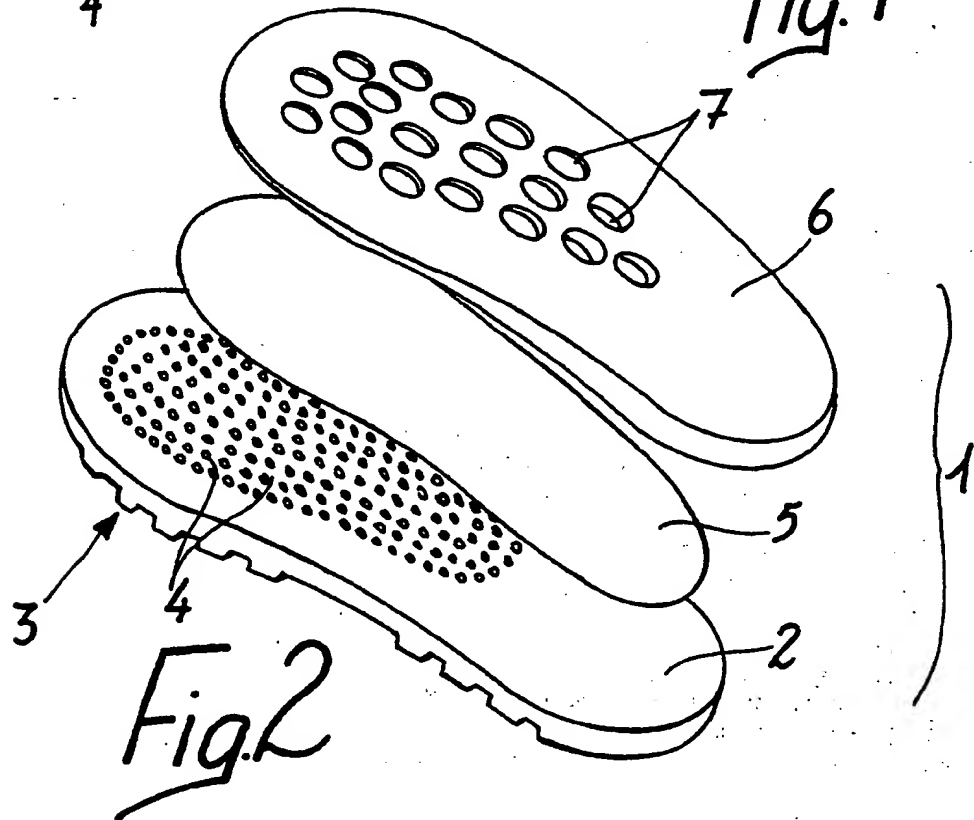
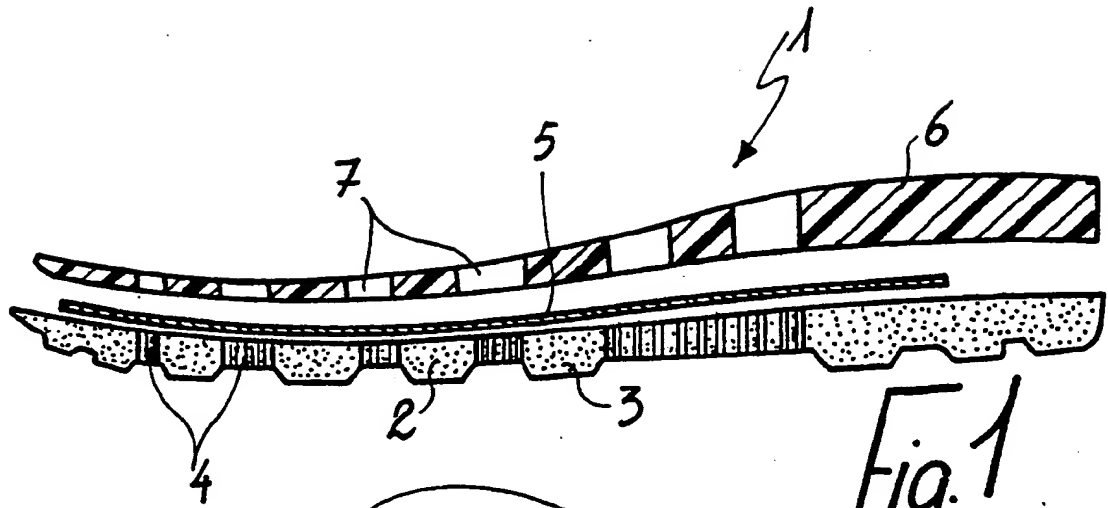
3. Sole structure according to claim 1, characterized in that the material which constitutes said membrane is preferably of the kind commonly termed "Gore-Tex" or of another equivalent kind of material.

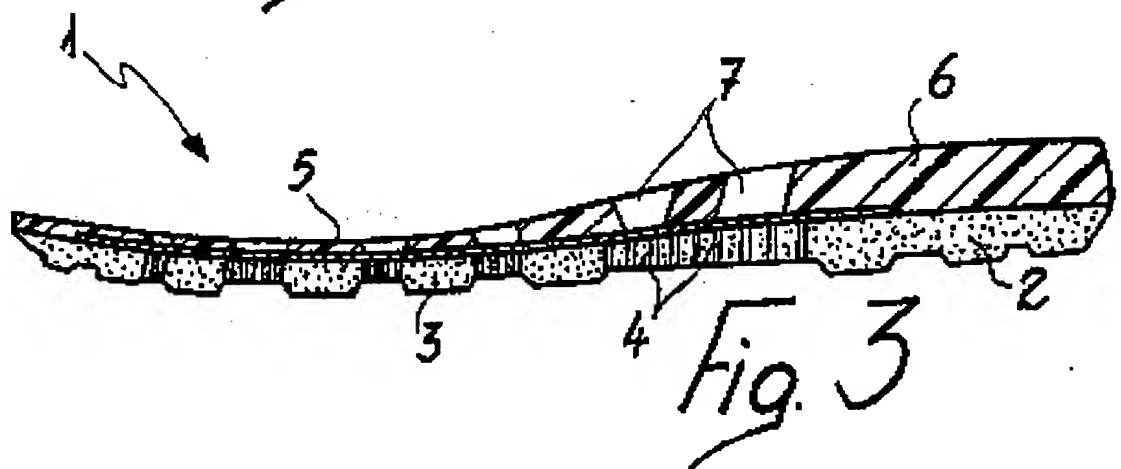
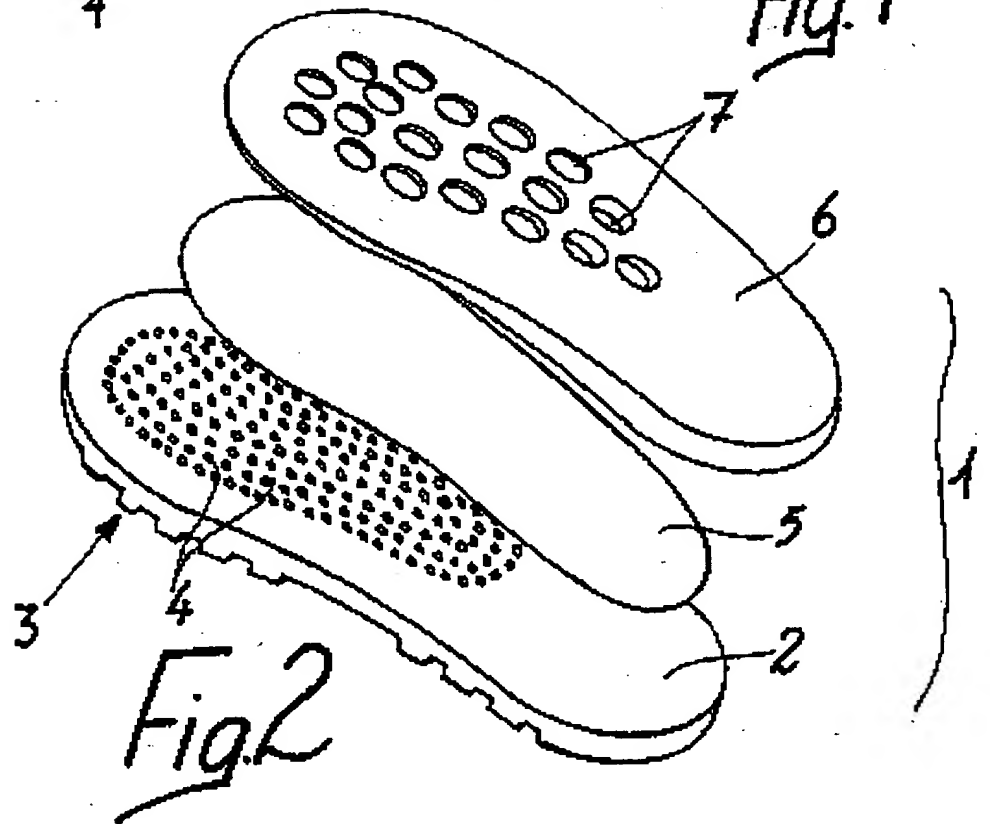
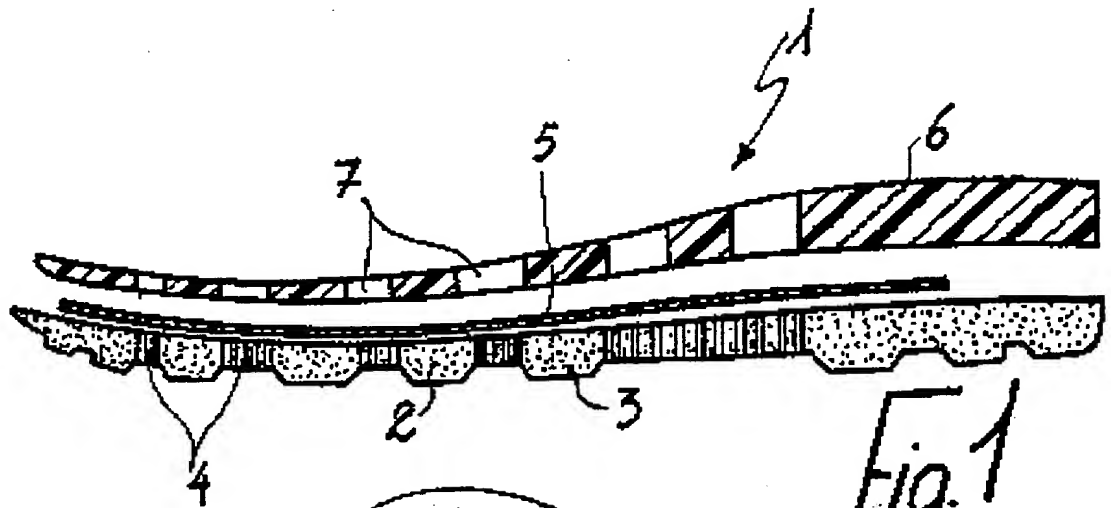
4. Sole structure according to claim 1, characterized in that said through holes are arranged on the entire extension of the upper part or only on a part thereof.

5. Sole structure according to one or more of the preceding claims, characterized in that said lower and upper parts are assembled with the interposition of said membrane so as to form a monolithic body with no fissures in the coupling regions.

6. Sole structure according to one or more of

the preceding claims, characterized in that the coupling between said elements can be effected by a method selected from among injection-molding and glueing together previously molded parts, regions affected by said micropores being unaffected by materials used for effecting coupling of said parts.





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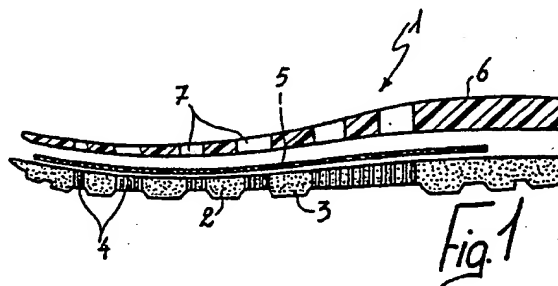
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**07.08.91 Bulletin 91/32**(71) Applicant: **POL SCARPE SPORTIVE S.r.l.**  
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**EP 0 382 904 A3**



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## EUROPEAN SEARCH REPORT

Application Number

EP 89 12 1612

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	GB-A-1 407 372 (SCHWARTZ) -----		A 43 B 13/12
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			A 43 B
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of search 14 May 91	Examiner ANDEREGG P-Y.F.
<div>CATEGORY OF CITED DOCUMENTS</div> <div>X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background Q: non-written disclosure P: intermediate document T: theory or principle underlying the invention</div> <div>E: earlier patent document, but published on, or after the filing date D: document cited in the application L: document cited for other reasons ----- &amp;: member of the same patent family, corresponding document</div>			